REMARKS

This amendment is submitted in response to the Examiner's Final Action dated February 24, 2004. Applicant has amended the claims in line with Examiner's suggestions in paragraph 2 of the Office Action. Applicant has further incorporated features from dependent claims (now canceled) into their respective independent claims. These latter amendments provide independent claims with a more comprehensive recitation of the novel features of Applicant's invention. No new matter has been added and the amendments reduce issues for appeal. Applicants respectfully request entry of the amendments to the claims. The arguments/discussion provided below to rebut claim rejections (and overcome claim objections) reference the claims in their amended form.

CLAIM OBJECTIONS

Examiner objects to Claims 1, 9 and 15 and Claims 8 and 20 at paragraph 2 of the Office Action. Applicant has amended each of these claims to correct any informality contained therein. The amendments overcome the objections, and Applicant respectfully requests removal of the objection to the above claims.

CLAIMS REJECTIONS UNDER 35 U.S.C. § 102

At paragraph 3.1 of the Office Action, Claims 20-23 are rejected under 35 U.S.C. § 102(b) as being anticipated by *Alamouti* (U.S. Patent No. 5,784,417). Claims 21 and 22 have been canceled and their features incorporated into Claim 20. *Alamouti* does not anticipate the above claims because *Alamouti* does not teach each feature recited by these claims. Applicant hereby incorporates by reference the arguments provided in Amendment A, filed on December 5, 2003.

The specific combination of system components and associated functionality recited by Applicant's claims is not taught by *Alamouti*, which merely depicts and describes the general implementation of cyclic TCM encoding and decoding schemes. Applicant's claims, in contrast, are directed to providing a specific functionality of a TCM coding scheme within a GPRS/EDGE network system, which is configured with a QAM component having very specific additional functionality affecting the method by which data is modulated via the TCM encoder.

Claim 20 recites the following **combination** of system components and associated functionality, which are not taught by *Alamouti*: (1) "a Trellis encoder ... **maximizes an Euclidean distance** between neighboring words of said data **to reduce signal power** required for transmission of said data;" (2) "**a quadrature amplitude modulator** ... utilizing Quadrature Amplitude Modulation (QAM) to **increase capacity and data rates within an available bandwidth**, wherein Trellis coded modulation is provided on top of said QAM during a coding sequence;" and (3) "a Trellis decoder."

Figure 8 of *Alamouti*, relied on by Examiner, illustrates generic cyclic trellis encoder and decoder systems. There is no depiction within Figure 8 or the description of Figure 8 (at col. 13, ll 31-63) of a QAM modulator associated with the TCM encoder. Also, *Alamouti's* description of TCM encoding is devoid of any reference to QAM being applied within the TCM encoding scheme. While Col. 1, lines 32-34 provides a general introduction of QAM, there is no actual description of a QAM modulator providing the specific functionality within TCM encoding scheme, as described by Applicant's claims.

In the analysis of the feature of Applicant's claim that "maximizes an Euclidean distance between neighboring words" Examiner incorrectly concludes that this feature is provided at col. 3, ll 57-64 of by *Alamouti*. As quoted by Examiner, that section states "... a trellis encoder ... input data ... modulation scheme **cannot** ... results in a substantially increased minimum Euclidean distance between points of the signal constellation," (bolded emphasis added). This section is devoid of any discussion/teaching of "maximizing" the Euclidean distance for the purpose of "reducing signal power required for transmission of data." Clearly, Applicant's claimed invention involves some internal calculation that provides a **maximum** distance to enable reduction in signal power required. *Alamouti*, in contrast describes avoiding the use of a particular modulation scheme that would result in a substantial increase in the **minimum** Euclidean distance.

Alamouti thus teaches a different schema from Applicant's claimed invention. Even one not skilled in the art can apply a simple English language analysis (rather than a more complex

technical analysis) to appreciate that *Alamouti* provides a different purpose, different implementation and different result than that provided by Applicant's claimed invention.

Notably, Examiner later admits (at page 6, second-to-last paragraph discussing the 103 rejection) that *Almouti* does not specifically describe the maximizing of Euclidean distance feature of Applicant's claims. This assertion by Examiner is inconsistent with the present 102 rejection, which requires the reference specifically teach each feature recited within the claims. As clearly outlined above and agreed to by Examiner, *Alamouti* fails to meet this standard and therefore does not anticipate Applicant's claimed invention. Applicant's claims 20-23 are therefore allowable.

CLAIMS REJECTIONS UNDER 35 U.S.C. § 103

At paragraph 4.1 of the Office Action, Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Alamouti* in view of *Wei* (EP Patent No. 0486729) and further in view of *Mazur, et al.* (U.S. Patent No. 6,438,115).

At paragraph 4.2 of the Office Action, Claims 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Alamouti* in view of *Mazur, et al.* (U.S. Patent No. 6,438,115).

The primary reference relied upon by Examiner to support both 103 rejections is *Alamouti*. However, *Alamouti* is devoid of any teaching or suggestion of several key features of Applicant's claimed invention. Applicant again reiterates the above arguments directed at the section of *Alamouti* relied on by Examiner to support the rejection of the function of Applicant's encoding scheme that involves maximizing the Euclidean distance between words to reduce signal power. Having agreed at page 6 of the Office Action with Applicant's argument that *Alamouti* does not teach "a modulation scheme results in substantially reducing the signal power required...", Examiner references *Wei* to provide support for the rejection of this feature.

Wei, however, also fails to teach or suggest this feature, and the cited sections of Wei, namely, col. 8, lines 57, col. 12, ll 5-45, col. 13, ll 6-25 and Figures 8-9 are devoid of any such teaching or suggestion. Further those sections do not teach or suggest the complete functionality

associated with use of the Trellis encoder of Applicant's recited claims, namely, "substantially eliminate fading on the transmission channel and increase capacity on an allocated bandwidth by providing a maximum Euclidian distance between words of said data during encoding, which distance substantially reduces signal power required for transmitting said data over a wireless channel."

Col. 8, line 57 describes "use of such ∏/M-shifted modulation can help to reduce the peak-to-average power ratio..." during a phase shift of the carrier of a "∏/M-Shifted M-DPSK modulator" Col. 12, ll 5-15 describes a parameter referred to as the **"minimum squared** Euclidian distance at X-fold time diversity", which is "useful in the design of codes ... for the folding channel..." (emphasis added). The remainder of the section (line 16-45) describes an example that factors in vehicle speed, etc. in calculating the coding gain. Column 13, ll 6-25 describes **"re-ordering schemes"** to be used within an interleaver in order to maximally separate codewords to "give rise to the desired X-fold **built-in time diversity"** (emphasis added).

While a combination of *Alamouti* with Wei may have been contemplated by one skilled in the art, the synergy from such a combination would not have made the above features of Applicant's claimed invention obvious, since those features are related to tapping into and combining specific functional features of different components to yield a specific result that is not contemplated or suggested by the combination of the references. That is, given the very different purpose, implementation and results for use of the interleaver, the mere mention of the term "maximally separated" would not motivate one skilled in the art to expand the general encoder scheme of *Alamouti* to include an analysis for the maximum Euclidean distance in order to reduce signal power required.

Given the above reasons, it is clear that neither combination of references suggests key features of Applicant's invention. One skilled in the art would not find Applicant's invention unpatentable over these combinations of references. The above claims are therefore allowable over the combinations.

CONCLUSION

Applicant has diligently responded to the Office Action by amending the claims to overcome objections and rejections and to more comprehensively present the key features of Applicant's claimed invention in single independent claims. Applicant has further explained why the claims are not anticipated by or unpatentable over the cited references or combinations thereof. The amendments and arguments overcome the objections and §102 and §103 rejections. Applicant, therefore, respectfully requests reconsideration of the rejections and issuance of a Notice of Allowance for all claims now pending.

Applicant also requests the Examiner contact the undersigned attorney of record at 512.343.6116 if such would further or expedite the prosecution of the present Application.

Respectfully submitted,

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